

REMARKS

Claims 1-7, 19, 20, 31, 34, 39, 41, 43 and 44 are pending in the present application. Claims 1-3, 19, 20, 34 and 39 have been amended and claims 8-18, 21-30, 32, 33, 35-38, 40 and 42 have been canceled by the present amendment or a previous amendment. Claims 1, 19, 20, 39 and 41 are independent. Reconsideration of this application, as amended, is respectfully requested.

Interview with Examiner

An interview was conducted with the Examiner in charge of the above-identified application on January 7, 2010. Applicants greatly appreciate the courtesy shown by the Examiner during the interview.

In the interview with the Examiner, Applicants' representative discussed amending the independent claims to recite that the viscous medium in the "add-on jetting" step, for instance, is solder paste. The Examiner also pointed out that claim 1 was unclear with regard to which predetermined position was being referred to in the step of determining. The Examiner indicated that amending the claims to recite the add-on jetting as solder paste and clarifying that the predetermined position in the determining step is the predetermined position of the add-on jetting would overcome the rejections of record. However, further consideration and search would be necessary before allowance of the claims could be indicated.

As the Examiner will note, the claims have been amended in the manner discussed during the interview. Reconsideration and withdrawal of the Examiner's rejections are therefore respectfully requested.

Rejection Under 35 U.S.C. §§ 102 and 103

Claims 1, 8, 19, 20, 31, 34, 39 and 43 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Todd et al., U.S. Patent No. 5,639,010 with Baker, U.S. Patent No. 5,364,011 as intrinsic evidence for non-contact dispenser. Claims 1-8, 19, 20, 31, 34 and 37-44 stand rejected

under 35 U.S.C. § 103(a) as being unpatentable over Cutting et al., U.S. Patent No. 5,638,597 in view of Shiba et al., U.S. Patent No. 5,714,195. These rejections are respectfully traversed.

As the Examiner will note, the claims have been amended to further define the present invention over the references relied on by the Examiner. Specifically, the independent claims have been amended to recite that the add-on jetting is solder paste.¹ This subject matter was previously presented in dependent claims 37 and 38, for instance. Applicants respectfully submit that none of the references relied on by the Examiner teach or suggest this aspect of the present invention.

With regard to the Todd et al. reference, this reference is directed to the mounting of surface mount devices. The Examiner did not reject claims 37 and 38 in view of the Todd et al. reference. Therefore, it is believed that the Examiner's rejection in view of the Todd et al. and Baker references has been overcome. However, referring to Figure 1 of this reference, the Examiner has relied on the adhesive patch 18 as the "add-on jetting" of claim 1, for instance. Since claim 1 has been amended to recite that the "add-on jetting" is solder paste, Applicants respectfully submit that the Todd et al reference has been overcome. The Baker reference is also silent with regard to this aspect of the present invention and therefore fails to make up for this deficiency of Todd et al.

With regard to the Cutting et al. reference, this reference is directed to the manufacture of a circuit board. Referring to Figure 7 of this reference, the Examiner considers the application of solder preform decals 411 and additional solder described at column 5, lines 15-17 of Cutting et al. to be the "add-on jetting" of claim 1, for instance. Referring to column 4, line 52 through column 5, line 21 of Cutting et al., it is described that the substrate is screen printed with solder paste (Note: at paragraph 5 of the Office Action, it is stated that the substrate in Cutting et al. is screen printed with solder and not solder paste; however, this is clearly incorrect).

¹ It is noted that claim 41 has not been amended, but also includes the step of "add-on jetting" being solder paste.

At this portion of Cutting, it is also described that “solder may need to be applied to pad arrays” at column 4, lines 61-62. This solder application is completely separate from the solder paste application (see Figure 7).

At column 5, lines 12-17 of Cutting et al., there is additional solder (not solder paste) that is added. However, there is no solder paste added to either of the above-mentioned solder paste application or the solder application. In view of this, Cutting et al. does not disclose “add-on jetting” of solder paste as recited in claim 1.

It should be noted that solder paste and solder are quite different materials. Solder paste is like tooth paste, including powdered metal solder suspended in a thick flux. The flux is used as a temporary adhesive to hold components for soldering (not by adding solder, but heating the substrate to dissolve the flux, resulting in a soldered joint). Solder is metal, which is hard at room temperature. Therefore, solder must be heated in order to apply the solder to the substrate.

One of ordinary skill in the art would recognize that solder paste would not be added to previously soldered locations. Also, although it may have been known to inspect a substrate that has previously been screen printed with a viscous medium, so that corrections can be made, Applicants submit that it was not known prior to the present invention to add-on jet solder paste to a previously screen printed substrate **when the add-on jetting of the solder paste is “predetermined” (determined prior to screen printing) as claimed.**

The Shiba et al. reference is also silent with regard to “add on jetting” of solder paste and therefore fails to make up for this deficiency of Cutting et al. Furthermore, Shiba et al. discloses a device for making a color filter for an LCD (Liquid Crystal Display). Specifically, a bubble jet device is used for repair of defective color pixels. Shiba et al. is not directed to surface mount technology and therefore, there are no components mounted on the substrate in Shiba et al. In view of this, the Shiba et al. reference is not relevant to the present invention and Cutting et al., which are directed to surface mount technology. In view of this, the Examiner’s modification of Cutting et al. is improper and should be withdrawn. One having ordinary skill in the art would not look to Shiba

et al. for the solution to any problem experienced in the Cutting et al. device. In other words, Shiba et al. is non-analogous prior art.

It should also be mentioned that Shiba et al. includes an inspection device that inspects the substrate in order to determine if correction is deemed to be necessary. As illustrated in FIG. 1 of the present invention; however, the amount and position of the additional solder paste (add-on jetted solder paste) is determined prior to the screen printing. In this way, although it is possible to include an inspection device between the screen printer and the add on jetting device, it is not necessary to include such an inspection device. This is because the present invention is not only applicable to the situation where the add on jetting device is used as a correction device. As described in the present specification, the presently claimed invention is also applicable to a situation where certain portions of the screen printed substrate can be applied much more efficiently with a jetting device and therefore the amount and position of the additional solder paste is predetermined, i.e. known prior to screen printing on the substrate. This “predetermined” aspect of the present invention is described at page 8, second full paragraph of the present application.

Independent claims 19, 20, 39 and 41 also recite that the add-on jetting is “solder paste” in a similar manner to independent claim 1. Therefore, these claims are allowable for the same reasons mentioned above with regard to independent claim 1.

With regard to dependent claims 2-7, 31, 34, 43 and 44, Applicants respectfully submit that these claims are allowable due to their respective dependence on independent claims 1, 19, 20, 39 and 41, as well as due to the additional recitations in these claims.

In view of the above amendments and remarks, Applicants respectfully submit that claims 1-7, 19, 20, 31, 34, 39, 41, 43 and 44 clearly define the present invention over the references relied on by the Examiner. Reconsideration and withdrawal of the Examiner’s rejections under 35 U.S.C. §§ 102 and 103 are therefore respectfully requested.

CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

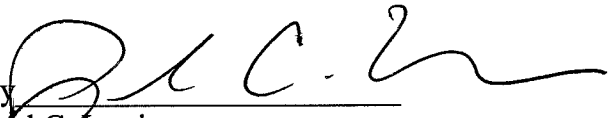
It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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